

5 CLAIMS:

1. A soft contact lens having a generally concave posterior surface for fitting to the eye of a wearer, and a convex anterior surface, the contact lens having mechanical properties and/or a geometric shape such that when the lens is fitted to the eye the pressure applied to the eye by or via the lens will vary in a radial direction between at least one zone of higher pressure and at least one zone of lower pressure, the pressure gradient between said zones, and the location of said zones, being selected so as to cause a dimensional change to the surface layer of the cornea of the eye to thereby at least temporarily cause the refractive state of the eye to change.
2. A soft contact lens according to claim 1 wherein said posterior surface has a shape that differs from the contour of the eye such that a first annular portion of the lens at a selected radial distance from the center of the lens will be closer to the surface of the eye than a second annular portion of the lens at a different second selected radial distance from the center of the lens.
3. A soft contact lens according to claim 2 wherein the pressures applied to the eye at the first annular portion and at the second annular portion are such as to define a pressure gradient which is sufficiently steep that epithelial thickness will tend to increase from the zone of high pressure towards the zone of low pressure.
4. A soft contact lens according to any preceding claim wherein the lens is constructed so as to have a natural orientation and an everted orientation, the lens being stable in both orientations, and wherein the posterior surface of the lens in said everted orientation is defined by the anterior surface of the lens in said natural orientation.
5. A soft contact lens according to any preceding claim wherein the lens is formed of a material with oxygen transmissibility greater than 87 barrers.
6. A soft contact lens according to any preceding claim wherein the lens has an elastic modulus of between 0.2 and 10.0 MPa.
7. A soft contact lens according to any preceding claim wherein the lens is comprised of a silicone hydrogel material.

- 5 8. A soft contact lens according to any preceding claim wherein the lens has a back vertex power of between +10D and -35D.
9. A soft contact lens according to any preceding claim wherein the lens has a center thickness of between 0.04 mm and 0.31 mm.
- 10 10. A soft contact lens according to any preceding claim having an annular zone of lower pressure at a distance less than approximately 4 mm from the center of the lens.
11. A soft contact lens according to any preceding claim having an annular zone of higher pressure at a distance of approximately between 3 mm and 6 mm from the center of the lens.
- 15 12. A method of refractive error reduction of an eye by corneal reshaping including the steps of:
- determining the required refractive correction for the eye;
- characterizing the surface shape of at least that part of the eye which is to be subjected to reshaping; and
- 20 selecting a soft lens formed of a material and having a geometric configuration such that when fitted to the eye will apply pressures to the surface of the eye in such manner as to assist in the required corneal reshaping.
13. A method according to claim 12 wherein said selection process involves a modeling process adapted to predict anticipated pressures and different zones of the
- 25 wearer's eye.
14. A method according to claim 13 wherein said modeling process is a finite element modeling process.